Exhibit R-2 RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/BA4	R-1 ITEM NOMENCLATURE Carrier Systems Development – 0603512N

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total P.E. Cost	54.046	109.208	142.783	138.976	147.753	60.476	69.275	64.142	Cont.	Cont.
S1722 CV Weapons Elevator Improvements	.821	1.005	1.026	1.051	1.080	1.108	1.141	1.169	Cont.	Cont.
42208 Future CV R&D	15.020	19.384	111.694	115.039	130.171	56.814	62.909	57.735	Cont.	Cont.
42678 CVN Technology Insertion	0	49.885	0	0	0	0	0	0	0	49.885
S2693 Carrier Systems Definition	31.124	35.159	24.665	14.546	13.278	0	0	0	Cont.	Cont.
W1723 CV Launch & Recovery Systems	3.107	2.609	1.839	4.067	2.331	2.554	5.225	5.238	Cont.	Cont.
W2269 EAF Matting	3.974	1.166	3.559	4.273	.893	0	0	0	0	17.596
Quantity of RDT&E Articles & cost										

A. Mission Description and Budget Item Justification: This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

(U) (S1722) – Development of standardized, supportable and maintainable aircraft carrier weapons elevators components

(U) (42208 formerly 22208) – Development of ship hull, mechanical, electrical, aviation and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, survivability and operational capabilities and to meet the requirements of existing and pending regulations and statues critical to the operation of existing and future aircraft carriers.

(U) (42678) – Development of technologies for transition from CVN 77 to CVNX, for demonstrating enhanced capabilities for CVNX, and for mitigating CVNX cost or technical risk.

Exhibit R-2 RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/BA4	R-1 ITEM NOMENCLATURE Carrier Systems Development – 0603512N

(U) (S2693 formerly PE 0603564N/22300) – Supports post Milestone 0 ship system technical definition and initial cost estimates through studies for various ship alternatives being considered in the Analysis of Alternatives (AOA). This project supports interim Operational Requirements Document (ORD) preparation and develops the primary supporting documentation for Milestone I decisions.

(U) (W1723) – Development of all systems required to provide approach and landing guidance and control, recovery, service, support and launch aircraft operating onto or from ships. Payoffs include increased safety, greater sortie generation rates, enhanced aircraft boarding rates, reduced manning, increased aircraft service life and fleet modernization.

(U) (W2269) – Development of lightweight mat and expeditionary arresting gear for use at Marine Corps Expeditionary Airfields (EAF).

Exhibit R-2 RDT&E Budget Item Justification	Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT&E/BA4	R-1 ITEM NOMENCLATURE Carrier Systems Development – 0603512N

B. Program Change Summary:

	FY 1998	FY 1999	FY 2000
FY 1999 President's Budget	19.976	154.307	174.033
Appropriated Value:	98.587	74.307	
Adjustment to FY 1998/99 Appropriated Value/			
FY 1999 President's Budget:			
a. Various Adjustments	+30.238	-45.099	+28.003
b. Congressional Adjustments	-78.611		
c. BTR	+ 3.832		
d. Program Adjustments			-59.253
FY 2000 President's Budget Submit	54.046	109.208	142.783

Funding: FY98 change (31.110) FY99 change (-45.009) and FY00 change (28.003) due to CVX programmatic adjustments, realignment of various carrier projects, inflation adjustments, competitive sourcing savings associated with consolidation of service contracting efforts, and NAVAIR internal realignment.

Schedule: FY 98 decrease caused delay in ATL DEMVAL award to 2QFY99 and delay of Armor and ATL PDR to FY2000.

Technical: Not applicable.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CV Weapons Elevator Improvements S1722

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	.821	1.005	1.026	1.051	1.080	1.108	1.141	1.169	Cont.	Cont.
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

This project provides for advanced development, fabrication, test, evaluation and documentation of standardized aircraft carrier weapons elevators components such as control systems, hoist machinery, doors and hatches. Emphasis is placed on the reduction of total ownership cost, improvement of safety, reliability, maintainability and watertight integrity and weight reduction.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

• FY 1998 ACCOMPLISHMENTS:

(U) ($.100) – Completed Variable Speed Drive Performance Spec Report.
(U) ($.226) – Developed imbedded sensors for monitoring elevator equipment condition.
(U) ($.070) – Completed remote sensor tests.
(U) ($.200) – Procured linear actuating system for elevator doors at LBES.
(U) ($.050) – Completed EMI test.
(U) ($.074) – Conducted investigation of alternative elevator overspeed governor designs.
(U) ($.101) – Tested wire rope coatings to prevent internal corrosion at termination.

• FY 1999 PLAN:

(U) ($.394) – Conduct investigation and engineering analysis for integration of multiple elevator controllers into Control Net.
(U) ($.250) – Continue development, procurement and test of alternative elevator overspeed governors.
(U) ($.210) – Complete development, procurement and testing of imbedded sensors in conjunction with PLC.
(U) ($.150) – Complete linear actuator tests.

(U) ($.001) – Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CV Weapons Elevator Improvements S1722

• FY 2000 PLAN:

(U) ($.300) – Complete Linear Drive Ropeless Elevator Research.

(U) ($.334) – Develop Intelligent Controls for Multiple Car Systems.

(U) ($.392) – Complete Design for Scale Model Ropeless Elevator.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CV Weapons Elevator Improvements S1722

B. Other Program Funding Summary: Not applicable

C. Acquisition Strategy: Not applicable

D. Schedule Profile.

	FY 1998	FY 1999	FY 2000	To Complete
Program Milestones	4Q Complete Variable Speed Drive Performance Spec	2Q Complete Multiple PLC Investigations	4Q Complete Design for Model Ropeless Elevator	3Q Build Scale Model Looped elevator Investigate the Reconfigured Power supplies
Engineering Milestones	4Q Complete Imbedded Sensor Research	1Q Complete Alternate Overspeed Governor Research	2Q Complete Linear Drive Ropeless Elevator Research 3Q Develop Intelligent Controls for Multiple Car Systems	4Q Test scale model Looped elevator Design Full Scale Looped elevator w/ advanced actuators
T&E Milestones	3Q Complete Remote Sensor Test 2Q Complete EMI Test	4Q Complete Imbedded Sensor Test 3Q Complete Linear Actuator Test 4Q Complete Alternative Overspeed Governor Rest		
Contract Milestones	4Q Procure Linear Actuator	2Q Procure Overspeed Governor		

Exhibit R-3, RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CV Weapons Elevator Improvements S1722

2Q Procure Imbedded SensorsCost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Phila		.755	12/99	1.026	12/99	.		Cont.	Cont.	N/A
Ancillary Hardware Development		Misc	.821									
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			.821	.755		1.026		.		Cont.	Cont.	N/A
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			N/A	N/A		N/A				N/A	N/A	N/A
Remarks:												
Developmental Test & Evaluation	WR	NSWC Phila	0	.250	12/98	0				Cont.	Cont.	N/A
Operational Test & Evaluation												
Tooling												
GFE												

Exhibit R-3, RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CV Weapons Elevator Improvements S1722

Subtotal T&E			0	.250		0				Cont.	Cont.	N/A
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			N/A	N/A		N/A				N/A	N/A	
Remarks:												
Total Cost			.821	1.005		1.026				Cont.	Cont.	
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	15.020	19.384	111.694	115.039	130.171	56.814	62.909	57.735	Cont.	Cont.
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification

This project provides for the development of aircraft carrier specific technologies, the infusion of the surface ship technology base into existing and future aircraft carriers and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

- FY 1998 ACCOMPLISHMENTS:

(U) ($1.706) – Continued development of advanced aircraft launch alternatives including an Advanced Technology Aircraft Launcher (ATL), flight deck aviation support such as ski jump integration, development of an integrated rapid aircraft turnaround capability to reduce manpower on the flight deck, and development of an Aviation Weapons Information Management System for incorporation on current and future aircraft carriers.

(U) ($10.959) – Commenced propulsion plant assessments including nuclear and conventional power generation, integrated machinery controls, integrated electric power systems and advanced auxiliary systems.

(U) ($1.000) – Commenced development of advanced passive survivability concepts including armor, underbottom, side protection systems and carrier-suitable, pro-active, tactical and damage response systems for incorporation on current and future aircraft carriers.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

(U) ($1.355) – Assessed emerging technologies to enable significant reductions in manpower requirements and incorporate on current and future aircraft carriers.

• FY 1999 PLAN:

Propulsion Plant Development

(U) ($1.600) Develop preliminary propulsion plant functional requirements. Commence development of plant component arrangements, including size and weight of structural members and required shielding. Initiate sizing of major plant component foundations.

(U) ($2.000) Initiate early stages of heat exchanger detailed design, including shock and sizing analyses, to reduce weight and cost while meeting power output requirements.

(U) ($1.500) Develop initial fluid system functional requirements. Begin developing fluid system schematics, descriptions and diagrams. Undertake preliminary main coolant pump hydraulic motor design.

(U) ($1.600) Start description of functional requirements for instrumentation and control systems and equipment. Begin developing advanced propulsion plant control and automation schemes with analysis of manpower cost.

(U) ($4.194) Determine preliminary electric system functional requirements. Perform electrical plant computer modeling and analysis. Establish turbine generator power rating and voltage, and do conceptual design. Initiate development of procurement specifications. Identify electric plant interface constraints and being refining layout concepts to ensure compatibility with NIMITZ hull form.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

(U) ($3.200) Develop preliminary steam plant performance and functional requirements. Establish structural member sizes for major steam plant component foundations. Identify steam plant interface constraints and begin refining layout concepts to ensure compatibility with the NIMITZ hull form.

(U) ($4.800) Begin identifying potential impacts of new propulsion plant systems on hull and watertight bulkhead penetrations. Begin developing and integrating non-propulsion mechanical systems with the propulsion plant including water purification; potable water; fire main and other fire fighting systems; heating, ventilation, and air conditioning; and ship service air systems. Assess preliminary sizing of emergency generator support systems.

(U) ($.490) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

• FY 2000 PLAN:

(U) ($45.300)-Non- Nuclear Propulsion Plant Development

(U) ($15.900) Begin preliminary turbine generator design, develop testing requirements and identify required testing capabilities for a prototype unit. Produce turbine generator schematic diagrams identifying all ship and system connections..

(U) ($5.800) Integrate steam and electric plant equipment with non-propulsion equipment layouts. Determine major system requirements and performance criteria and provide information for the integrated product model. Establish non-propulsion systems interface requirements with propulsion plant and power distribution systems.

(U) ($7.000) Continue developing enhancements to the product data management software and prototype automated workflow for construction deliverables. Develop design analysis features required for propulsion plan design development.

(U) ($16.600) Begin developing conceptual designs for optimized mechanical and electrical systems that interface with the propulsion plant. Establish interface controls between propulsion and non-propulsion equipment. Develop optimal volume and weight requirements for these mechanical and electrical systems. Establish layout of doors, ladders, passageways, hatches, and escape trunks integrated with the optimal propulsion plant.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

(U) ($39.000) – Aircraft Launch, Recovery & Support – Advanced Technology Launcher (ATL) Program Definition and Risk Reduction (PDRR) phase. Develop two, prototype, full size, fully integrated, reduced length, launcher systems. Validate System Specification. Initiate system engineering, technology assessment, and risk mitigation efforts. Conduct candidate energy storage, power electronics, control system and launch engine technology testing. Complete System Design Review and allocate Configuration Item performance requirements. Develop Configuration Item performance specifications. Complete Preliminary Design Review, initiate detailed design and development of product specifications. Initiate development of ATL Test Facility. Conduct site surveys and environmental impact studies. Identify facility and utility requirements. Complete architectural and engineering design. Initiate site construction. Initiate ATL Ship Integration Effort. Identify space and service allocation requirements for integration in CVN-68 class baseline hull. Prepare preliminary arrangement drawings identifying structural and arrangements impacts. Develop other hull, mechanical, and electrical system requirements.

(U) ($9.794) – Battle Damage Prevention & Recovery Initiate development of Upgraded Armor Protection System – Littoral (UAPS - Littoral), Dynamic Armor Protection System (DAPS), Underwater Protection System (UWPS), and New Torpedo / Mine Side Protection System (New T/MSPS). Define threats and design goals. Develop preliminary system designs and determine installation feasibility within ship concept designs. Develop plans for procurement and development of scaled test components. Prepare test facilities for small scale testing. Commence refinement of analytical capabilities. Improve Hull Girder analytic capability as part of Weapons Damage & Residual Strength analysis. Define design, producibility and material property goals for General Protective Plate and Advanced Shock Isolation of Equipment. Develop performance requirements for Advanced Damage Control System (ADCS). Commence fire vulnerability study in support of initiatives targeted at reducing operation and support costs of related systems. Commence development of enhanced damage control and firefighting concepts. Characterize topside threats for Topside Survivability. Characterize threats and evaluate use of explosive load reduction and anti-fratricide shielding protection techniques in support of Sympathetic Detonation Suppression System (SDSS) development. Commence development of improved weapons effects codes for Advanced Survivability Assessment Model (ASAP) and the application of finite element and hydro codes to provide enhanced modeling and simulation support for development of advanced passive survivability features.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

(U) ($2.200) – Manpower and Material Support – Initiate development of manpower and material support alternatives to achieve manpower reductions and total ownership cost savings. Included will be the development of advanced robotics for ship systems and components operation, maintenance and material handling in the areas of combat and intelligence, logistics and HMR&E. A standardized open system architecture approach will be incorporated into system and component development.

(U) ($10.400) - Combat and Intelligence Systems – Complete Phase II competitive solicitation for Combat Systems Integration concepts and design process. Continue monitoring improvements targeted at reducing the operational and support costs of the ship's war fighting systems. Initiatives remain focused on reducing the number of systems through the use of "multi-function" radars and flat planar antenna arrays, data exchange across operational areas, data fusion, and integrated displays for operators. Complete trade studies, including those that result in cost reductions without degrading operational performance into the design development. Evaluate and complete competitive Combat Systems Integration design development and integrate into the ship contract data package. Commence Phase III Design Refinement. Refine Combat Systems Integration design and integrate into the ship design.

(U) ($5.000) – Systems Development – Support CVNX Engineering Team for design, engineering and interoperability analysis to support Milestone I. Also support for Requirements and AOA Teams for TOC reductions/analysis, survivability analysis and CVNX Advanced Launch & Recovery, and trade studies and Lethality Studies (ORD Specific). Provide acquisition planning support.

B. Other Program Funding Summary

To Total

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Complete	Cost
Related RDT&E:										
0604567N/42301 CV Contract Design										
CVN-77	16.453	38.215	34.866	39.248	26.358	9.649	11.539	13.386	CONT	CONT
CVNX						15.000	15.000	15.000		
Related SCN:										
200100 Carrier Replacement Program										
	48.737	123.665	751.540	3,950.576	147.615	434.183	1,337.250	131.533	CONT	CONT

C. Acquisition Strategy: The Carrier acquisition strategy for CVN77 and follow hulls will be acquired/managed using a phased technology insertion or "evolutionary" strategy. Technologies will include island redesign (topside) on CVN77, new propulsion plant on CVX-1, and hull, distributive systems and functional arrangements on the CVX-2. On each hull, core capabilities will be maintained and Total Ownership Costs will be reduced in accordance with Carrier goals. As with past NIMITZ class carriers, the CVN77 will be awarded as a sole source FPIF contract to Newport News Shipbuilding. For CVX-1 and future hulls, various contracting methods are being considered.

D. Schedule Profile:

	FY 1998	FY 1999	FY 2000
Program Milestones		CVX: 1Q AoA PART II	CVX: 2Q MS1
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

Primary Hardware Development												
Aircraft Launch, Recovery & Support	CPAF	TBD	0	0	N/A	13.913	11/99			50.337	64.250	64.250
	CPAF	TBD	0	0	N/A	13.913	11/99			132.739	146.652	64.250
	WR	NAWC Lakehurst NJ	2.711	0	N/A	0	0			0	2.711	
Battle Damage & Recovery	WR	NSWC/CD, MD	1.000	0	N/A	4.644	11/99			94.651	100.295	100.295
	WR	APG, MD		0	N/A	1.250	11/99			16.075	17.325	17.325
	ACES	NNS,VA		0	N/A	1.500	11/99			21.250	22.750	22.750
	C	U of Texas, TX		0	N/A	1.200	11/99			6.200	7.400	7.400
	C	Miscellaneous	1.511	0	12/98	1.200	11/99			Cont.	Cont.	Cont.
Propulsion Plant Development	SS,CPFP	BETTIS, PA	9.000	19.384	11/98	0	N/A			0	28.384	28.384
	C	NNS, VA				45.300	11/99			Cont.	Cont.	Cont.
	Various	Miscellaneous	2.299	0		0	N/A			0	2.299	
Manpower & Material Support	WR	NSWC/CD/MD				2.200	11/99			Cont	Cont.	Cont.
	Various	Miscellaneous	2.298	0		0	N/A			0	2.298	
Systems Development	Various	Miscellaneous				5.000	11/99			Cont.	Cont	Cont.
Combat & Intelligence Systems	C	NNS, VA				10.400	11/99			0	10.400	
Systems Engineering												
Aircraft Launch, Recovery & Support	ACES	NNS,VA				3.000	11/99			67.000	70.000	
	WR	NAWC/LK, NJ				2.400	11/99			25.680	28.080	
	Various	Miscellaneous				.774	11/99			8.283	9.056	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			18.819	19.384		106.694				Cont.	Cont.	Cont.

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

Remarks: The acquisition strategy calls for competitive development of 2 prototype systems. Each contract is budgeted at $64.25M. Following a "shoot-off" between prototypes, one system will be chosen for further development for installation in CVNX 1. The second phase of the development effort is budgeted at $82.402M, and is reflected in the Cost to Complete and Total Cost of the second contract. $70M is budgeted for ship system integration. Pending selection of the CVNX 1 shipbuilder, this effort will be conducted by NNS under the existing ACES contract. In addition to NAWCADLKE, the Volpe Center (DOT), and the Argonne National Lab (DOE) will provide technical support.

Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			N/A	N/A		N/A				N/A	N/A	N/A
Remarks:												
Developmental Test & Evaluation Aircraft Launch, Recovery & Support	CFAF WR	Miscellaneous NAWC/LK, NJ				5.000	11/99			3.000 22.600	13.000 22.600	
Operational Test & Evaluation Aircraft Launch, Recovery & Support	WR	NAWC/LK, NJ								12.500	12.500	
Tooling												
GFE												
Subtotal T&E			N/A	N/A		5.000				43.100	48.100	N/A
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Future Carrier R&D- 42208

Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			N/A	N/A		N/A				N/A	N/A	N/A
Remarks:												
Total Cost			18.819	19.384		111.694				Cont.	Cont.	N/A
Remarks:												

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	0	49.885	0	0	0	0	0	0	0	49.885
RDT&E Articles Qty	0	0	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

This one year project was established to fund the research, development, test, and evaluation, and for acquisition of technologies for use in the CVN 77 aircraft carrier program. Specifically, the technologies funded are those which transition from the CVN 77 aircraft carrier program to the CVNX aircraft carrier program, that demonstrate enhanced capabilities for the CVNX aircraft carrier program, and that mitigate the cost or technical risks of that program.

- FY 1998 ACCOMPLISHMENTS

Not Applicable

- FY 1999 PLAN

(U) ($1.259) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

(U) ($14.587) Establish contractor and management interface to the integrated product data environment to coordinate design development and manufacturing processes to achieve life cycle cost reductions. Establish data transfer protocols for the exchange of design data between shipyards. Develop product data management software for propulsion plant design and analyze data. Identify advanced analysis capabilities required for design development and begin testing product modeling software.

(U) ($18.187) Complete functional requirement documents for command and control, weapons and sensors, external communications, mission planning,

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

computing architecture, ship interface boundaries, and test and evaluation. Identify and commence trade studies intended to reduce cost without degrading operational performance. Commence Phase II; completing competitive solicitation and evaluation of solicitations to determine final two proposed integrators. Continue Combat Systems Integration concepts and design process. Identify updates to CVN 77 Contract Design ILS/Configuration Management Plan.

(U) ($15.852) Support CVNX Engineering Team for design, engineering and interoperability analysis to support Milestone I. Also support for Requirements and AOA Teams for TOC reductions/analysis, survivability analysis and CVNX Advanced Launch & Recovery, and trade studies and Lethality Studies (ORD Specific). Provide acquisition planning support.

- FY 2000 PLAN – Not applicable.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Complete
Related RDT&E:									
0604567N/42301 CV Contract Design									
CVN-77	16.453	38.215	34.866	39.248	26.358	9.649	11.539	13.386	CONT
CVNX						15.000	15.000	15.000	
Related SCN:									
200100 Carrier Replacement Program									
	48.737	123.665	751.540	3,950.576	147.615	434.183	1,337.250	131.533	CONT

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

C. Acquisition Strategy:

The Carrier acquisition strategy for CVN77 and follow hulls will be acquired/managed using a phased technology insertion or "evolutionary" strategy. Technologies will include island redesign (topside) on CVN77, new propulsion plant on CVX-1, and hull, distributive systems and functional arrangements on the CVX-2. On each hull, core capabilities will be maintained and Total Ownership Costs will be reduced in accordance with Carrier goals. As with past NIMITZ class carriers, the CVN77 will be awarded as a sole source FPIF contract to Newport News Shipbuilding. For CVX-1 and future hulls, various contracting methods are being considered.

D. Schedule Profile:

	FY 1998	FY 1999	FY 2000
Program Milestones		CVX: 1Q AoA PART II	CVX: 2Q MS1
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
	C	AME, Arl Va		2.000	01/99							
	C	JJMA, Arl Va		2.000	01/99							
	C	NNS, Va		18.500	01/99							
	WR	NSWC CD Va		4.200	01/99							
	WR	NAWC Lake Va		2.500	01/99							
	SS,CPFP	BETTIS, Pa		14.587	01/99							
	C	Contractor, Various		3.913	01/99							
	WR	Navy Field, Various		2.185	01/99							
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development				49.885		0				0	49.885	

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

Remarks:

Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												

Remarks

Exhibit R-3 Cost Analysis (page 2)		Date: February 1999

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER					PROJECT NAME AND NUMBER					
Cost Categories (Tailor to WBS or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99Cost	FY 99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management												

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. CVN Technology Insertion - 42678

Remarks												
Total Cost				49.885						0	49.9	
Remarks												

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Carrier Systems Definition – S2693

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
S2693 CV Systems Definition	31.124	35.159	24.665	14.546	13.278	0	0	0	Cont.	Cont.
Qty of RDT&E Articles & cost	0	0	0	0	0	0	0	0	0	0

A. (U) Mission Description and Budget Item Justification: This project performs the Ship Feasibility Studies required after Milestone 0 (MS 0) to address a specific Mission Needs Statement (MNS) and support the Analysis of Alternatives (AOA) for the Future Carrier (CVX) Program; performs impact studies of aircraft/air wing composition, propulsion, hull alternatives, combat systems, machinery and electrical subsystems, and cost on CVX designs, supports the development of the Operational Requirements Document (ORD) and other documentation required at Milestone I. Completion of this phase allows review and approval, at Milestone I, to transfer a ship program to the Contract Design Program Element 0604567N. Ship Feasibility Study products include a description of the alternative ships' principal characteristics and mission critical subsystems, weight estimates, general arrangement sketches, technical risk assessments, and Class F cost estimates. The objective is to provide the decision-makers with feasible, affordable alternatives.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1998 ACCOMPLISHMENTS:

- (U) ($26.864) Began and completed various aircraft carrier related studies to support ORD development and other documents for the Milestone 1 decision for the CVX. Studies were conducted, but not limited to, the following areas: logistics, propulsion, flight deck, auxiliary systems, combat systems and ship concepts.

- (U) ($1.500) Utilized existing and development commercial and government hardware and software, and developed interfaces where required, to enable rapid visualization and analysis of future carrier systems and ship concepts through development of virtual prototypes.

- (U) ($2.760) Provided CVX AOA engineering and cost estimating support.

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Carrier Systems Definition – S2693

FY 1999 PLAN

(U) ($.655) Portion of extramural program is reserved for Small Business Innovative Research assessment in accordance with 15 USC 638.

(U) ($29.372) Identify and evaluate propulsion plant functional and manning requirements, perform conceptual studies and analyze component arrangements. Evaluate possible turbine generator power ratings and voltages, identify performance requirements, and establish conceptual designs. Develop electric and steam plant weight and volume estimates and determine impacts on stability and survivability. Assess preliminary sizing of emergency generator support systems and major propulsion plant component foundations. Evaluate shock and sizing analyses of heat exchanger designs. Review possible instrumentation and control systems and equipment. Identify interface constraints and begin refining layout concepts to ensure compatibility with the NIMITZ hull form. Identify and assess potential impacts of new propulsion plant systems on hull and watertight bulkhead penetrations. Identify non-propulsion mechanical system concepts to be developed and integrated with the propulsion plant.

(U) ($5.132) Support CVNX Engineering Team for design, engineering and interoperability analysis to support Milestone I. Also support for Requirements and AOA Teams for TOC reductions/analysis, survivability analysis and CVNX Advanced Launch & Recovery, and trade studies and Lethality Studies (ORD Specific). Provide acquisition planning support.

FY 2000 PLAN

(U) ($13.190) Conduct ORD level requirements definition, industrial capability assessments, risk assessment and management, schedule development and tracking, and threat assessments necessary to insure a coordinated acquisition effort. Develop an Integrated Master Plan. Develop the Test and Evaluation Master Plan. Develop logistics requirements including integrated logistics assessments, maintenance planning, supportability analysis, logistics process improvements, computer resource requirements analysis, and manpower/workload assessments. Develop cost model and baseline cost estimate.

(U) ($11.475) Conduct engineering effort associated with the CVNX 2 Ship Development phase to develop ship requirements and definition at the total system level. Conduct trade studies to support total ship definition including baseline design/build budget and baseline cost estimate. Further develop IPPD.

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Carrier Systems Definition – S2693

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Complete	Cost	
Related RDT&E:											
0604567N/42301 CV Contract Design											
CVN-77	16.453		38.215	34.866	39.248	26.358	9.649	11.539	13.386	CONT	CONT
CVNX							15.000	15.000	15.000		
Related SCN:											
200100 Carrier Replacement Program											
		48.737	123.665	751.540	3,950.576	147.615	434.183	1,337.250	131.533	CONT	CONT

C. Acquisition Strategy:

The Carrier acquisition strategy for CVN77 and follow hulls will be acquired/managed using a phased technology insertion or "evolutionary" strategy. Technologies will include island redesign (topside) on CVN77, new propulsion plant on CVX-1, and hull, distributive systems and functional arrangements on the CVX-2. On each hull, core capabilities will be maintained and Total Ownership Costs will be reduced in accordance with Carrier goals. As with past NIMITZ class carriers, the CVN77 will be awarded as a sole source FPIF contract to Newport News Shipbuilding. For CVX-1 and future hulls, various contracting methods are being considered.

D. Schedule Profile:

Exhibit R-2a RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Carrier Systems Definition – S2693

	FY 1998	FY 1999	FY 2000
Program Milestones		CVX: 1Q AoA PART II	CVX: 2Q MS1
Engineering Milestones			
T&E Milestones			
Contract Milestones			

Exhibit R-3 RDT&E Project Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E / BA 4	Program Element Name & No. Carrier Systems Development- 0603512N	Project Name and Number. Carrier Systems Definition – S2693

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS, CPFP	BETTIS, PA	6.000	29.372	11/98	0				0	35.372	
		AME, VA	4.800	2.051	02/99	2.000	11/99			Cont.	Cont.	
	C, CPFF	JJMA, VA	5.200	1.000	02/99	1.000	11/99			Cont.	Cont.	
	C, CPFF	NSWC/CD, MD	3.000	0	-----	1.000	11/99			Cont.	Cont.	
	WR	NSWC/DD, VA	1.500	0	-----	1.000	11/99			Cont.	Cont.	
	WR	Miscellaneous	10.624	.503	02/99	2.000	11/99			Cont.	Cont.	
	Various	Miscellaneous		2.233	02/99	2.665	11/99			Cont.	Cont.	
	C	NNS				15.000	11/99			Cont.	Cont.	
Subtotal Product Development			31.124	35.159		24.665				Cont.	Cont.	N/A
Remarks:												
Support: Not applicable.												
Subtotal Support			N/A	N/A		N/A		N/A		N/A	N/A	N/A
Remarks:												
T&E: Not applicable												
Subtotal T&E			N/A	N/A		N/A		N/A		N/A	N/A	N/A
Remarks:												
Management: Not applicable												
Subtotal Management			N/A	N/A		N/A		N/A		N/A	N/A	N/A
Remarks:												
Total Cost			31.124	35.159		24.665		14.546		Cont.	Cont.	N/A

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. Future CV Launch & Recovery Systems, W1723

COST ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
W1723 CV Launch and Recovery Systems	3.107	2.609	1.839	4.067	2.331	2.554	5.225	5.238	Cont.	Cont.
Quantity of RDT&E Articles & cost	(2)			(1)						

A. Mission Description and Budget Item Justification: This project addresses the Program Definition and Risk Reduction Phase of advanced systems to meet Navy unique shipboard operational requirements. This program is funded under PS&RR because it encompasses feasibility and advanced development of new end-items prior to engineering and manufacturing development. This program includes the PD&RR phase of advanced optical, Electro-optical and laser tracking, approach and landing control and guidance systems; and air operations reporting systems for pilots, Landing Signals Officers (LSOs), and ship's force such as:

The Virtual Imaging System for Approach and Landing (VISUAL) will provide ship's force, LSOs, and the pilots with enhanced images of the aircraft and ship in low visibility and night conditions.

The Shipboard Optical Landing System (SOLS) will provide advanced visual landing aids (VLA) for fixed wing, rotary wing and Vertical/Short Take-Off and Landing (VSTOL) aircraft, so that pilots can fly safer and more accurate approaches to all classes of ships.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

- FY 1998 ACCOMPLISHMENTS:

(U) ($3.107) Continued design and integration of the VISUAL technology demonstration program and conducted technology demonstrations and evaluations of critical component, using the CV/CVN and LHA/LHD advanced development models (ADM). Continued user and industry involvement in the VISUAL development process. Conducted a Systems Design Review (SDR) and a Preliminary Design Review (PDR). Produced a draft system performance specification that will become the basis for engineering development model (EDM) request for proposals (RFP). Provided engineering and management support to the program. CV/CVN and LHA/LHD VISUAL ADMs funded under this subproject.

- FY 1999 PLAN:

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. Future CV Launch & Recovery Systems, W1723

(U) ($2.609) Continue design and integration of the VISUAL technology demonstration program and continue critical component demonstration and evaluations. Prepare documentation for a Milestone II decision to proceed to the E&MD Phase. Issue the EDM RFP, evaluate proposals, and select the EDM integration contractor. Provide engineering and management support to the program, particularly for the transition from the PD&RR phase to the E&MD phase of the program.

• FY 2000 PLAN:

(U) ($1.839) Continue milestone II decision to proceed to the Engineering and Manufacturing Development (E&MD) phase. Award contract to initiate the design and integration of the VISUAL EDMs. Continue critical component demonstration and evaluations of emerging technologies in support of the VISUAL EDM contractor. Provide engineering and management support to the program, particularly for the transition from the PD&RR phase to the E&MD phase of the program.

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Related RDT&E										
P.E. 0602122N (Aircraft Technology)										
P.E. 0604512N (Shipboard Aviation Systems)										

C. Acquisition Strategy: VISUAL is a Commercial Off The Shelf (COTS) procurement. The Navy is preparing a performance specification and will competitively award a fixed-price contract to deliver EDMs, with fixed-price production options.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. Future CV Launch & Recovery Systems, W1723

D. Schedule Profile:

	FY 1998	FY 1999	FY 2000
Program Milestones		VISUAL: 4Q MSII	
Engineering Milestones	VISUAL: 1Q SDR VISUAL: 2Q SDR	VISUAL: 2Q RFP VISUAL: 4Q PDR	
T&E Milestones		CV/CVN VISUAL (05/98) LHD/LHA VISUAL (08/98)	
Contract Milestones			VISUAL EDM: 1Q EDM Awd

Exhibit R-3, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. CV Launch & Recovery – W1723

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Wx	NAWCAD, LKE	19.532	2.609	10/01/98	1.839	10/01/99			Cont.	Cont.	
Ancillary Hardware Development	CPFF	KAMAN EM	4.900	0		0				0	4.900	
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			24.432	2.609		1.839				Cont.	Cont.	
Remarks:												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			N/A	N/A		N/A				N/A	N/A	
Remarks:												
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			N/A	N/A		N/A				N/A	N/A	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			N/A	N/A		N/A				N/A	N/A	

Exhibit R-3, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. CV Launch & Recovery – W1723

Remarks:												
Total Cost			24.432	2.609		1.839				Cont.	Cont.	
Remarks:												

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. EAF Matting W2269

Cost ($ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
W2269 EAF Matting	3.974	1.166	3.559	4.273	.893	0	0	0	0	17.639
RDT&E Articles Qty			2							

A. Mission Description and Budget Item Justification: This project addresses the Demonstration and Validation (DEMVAL) of lightweight airfield mat and expeditionary arresting gear to meet naval aviation unique Expeditionary Airfield (EAF) operational requirements, including transportability requirements on Maritime Prepositioning Ships (MPS).

The currently deployed EAF mat (AM-2) was developed for heavy fighter (such as the F-4) operations and is cumbersome to deploy. Lightweight (1/2 the weight of AM-2), less voluminous (1/2 the volume of AM-2), and easier to install (five days vice fifteen days to install a complete airfield) mat material may be technically feasible and commercially available, but must be evaluated for use with current type/model/series naval and Air Mobility Command (AMC) aircraft at conventional and Vertical and Short Take-off and Landing (VSTOL) airfields ashore. Candidate mat materials under consideration include reinforced synthetic composite materials and polyvinyl fiberglass. These mat materials will be configured and evaluated under Marine Corps operational scenarios.

The expeditionary arresting gear program will provide the Marine Corps with the capability to conduct short span arrestments of designated Navy and Marine Corps tail hook equipped aircraft in the expeditionary environment. The current arresting gear (M-21) cannot be adapted to operate on short span (100 feet or less) surfaces and is incapable of arresting the current inventory under casualty (no flaps or half flap) conditions. Installation of the M-21 required 24 hours, extensive excavation, and heavy support equipment. The M-21 has inadequate reliability and several replacement components are no longer produced. The replacement gear will provide air transportability, rapid setup, full inventory operational compatibility under all arrestment conditions, and adequate operational reliability. Two prototype systems will be built under this project.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

- FY 1998 ACCOMPLISHMENTS:

(U) ($3.974) Developed and validated high fidelity dynamic component simulation. Evaluated alternative energy absorber configurations, sheave dampers, and dual modulus tape constructions. Completed system level performance specification. Solicited and awarded a contract for design and fabrication of demonstration systems.

- FY 1999 PLAN:

(U) ($1.163) Evaluate alternative anchoring systems. Design and initiate fabrication of prototype arresting gear.

(U) ($.003) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

- FY 2000 PLAN:

(U) ($3.559) Complete fabrication of two prototype systems and initiate performance testing with deadloads.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. EAF Matting W2269

B. Other Program Funding Summary

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete
EAF OPN (PE 0206139M)	0	0	0	0	5.435	6.443	6.532	6.731	0

Related RDT&E: N/A

C. Acquisition Strategy: The advanced lightweight mat acquisition strategy envisions the solicitation of candidate material panels from commercial sources for evaluation in the laboratory and in the operational environment. Upon qualification of a viable material, limited production quantities will be procured for full scale environmental, performance, and operational testing. Production quantities will be procured from the commercial source in accordance with Marine Corps priorities.

The arresting gear acquisition strategy is predicated on the creation of a fully integrated team consisting of Navy and contractor personnel. Initial technology development and system design efforts will be shared between the partners. The commercial partner will take the lead in the prototype manufacturing effort; the Navy partner will lead the test effort; and the commercial partner will ultimately be tasked with system production.

Exhibit R-2a, RDT&E Project Justification		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY RDT&E/BA 4	Program Element Name & No. Carrier Systems Development – 0603512N	Project Name and Number. EAF Matting W2269

D. Schedule Profile

	FY 1998	FY 1999	FY 2000	To Complete
Program Milestones	A/G M/S I 3Q			
Engineering Milestones		A/G PDR 1Q CDR 4Q	A/G 2 Proto 4Q	
T&E Milestones				A/G DT 1Q-3Q
Contract Milestones	A/G RFP 1Q Award 3Q			

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT/BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development – 0603512N	PROJECT NAME AND NUMBER EAF Matting – W2269

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date			Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPAF	ESCO	3.247	.974	06/98	2.884	06/98			1.985	9.116	9.106
Ancillary Hardware Development	WX	NAWCADLKE	4.460	.107	10/98	.585	10/99			3.111	8.263	N/A
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees	CPAF	ESCO		.035		.090		.		.067	.192	.192
Subtotal Product Development			7.707	1.116		3.559				5.163	17.571	9.298
Remarks: ESCO contract has a total estimated cost of $9,397.677; a base fee of $281.920; and an award fee of $281. 920. No fee has been awarded to date under this contract.												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			N/A	N/A		N/A				N/A	N/A	N/A
Remarks:												
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			N/A	N/A		N/A				N/A	N/A	N/A
Remarks:												
Contractor Engineering Support												

Exhibit R-3 Cost Analysis		Date: February 1999
APPROPRIATION/BUDGET ACTIVITY: RDT/BA 4	PROGRAM ELEMENT NAME AND NUMBER Carrier Systems Development – 0603512N	PROJECT NAME AND NUMBER EAF Matting – W2269

Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			N/A	N/A		N/A				N/A	N/A	
Remarks:												
Total Cost			7.707	1.116		3.559				5.163	17.571	
Remarks:												